

Regional Information Report No. 3A06-08

Yukon River Salmon Age, Sex, and Length Database Error Checking and Finalization

**Final Report for Project URE 17N-05
U.S. Fish and Wildlife Service**

by

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and

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Division of Commercial Fisheries



Symbols and Abbreviations

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Weights and measures (metric)		General		Measures (fisheries)	
centimeter	cm	Alaska Administrative		fork length	FL
deciliter	dL	Code	AAC	mid-eye-to-fork	MEF
gram	g	all commonly accepted		mid-eye-to-tail-fork	METF
hectare	ha	abbreviations	e.g., Mr., Mrs., AM, PM, etc.	standard length	SL
kilogram	kg			total length	TL
kilometer	km	all commonly accepted			
liter	L	professional titles	e.g., Dr., Ph.D., R.N., etc.	Mathematics, statistics	
meter	m			<i>all standard mathematical</i>	
milliliter	mL	at	@	<i>signs, symbols and</i>	
millimeter	mm	compass directions:		<i>abbreviations</i>	
		east	E	alternate hypothesis	H _A
Weights and measures (English)		north	N	base of natural logarithm	<i>e</i>
cubic feet per second	ft ³ /s	south	S	catch per unit effort	CPUE
foot	ft	west	W	coefficient of variation	CV
gallon	gal	copyright	©	common test statistics	(F, t, χ^2 , etc.)
inch	in	corporate suffixes:		confidence interval	CI
mile	mi	Company	Co.	correlation coefficient	
nautical mile	nmi	Corporation	Corp.	(multiple)	R
ounce	oz	Incorporated	Inc.	correlation coefficient	
pound	lb	Limited	Ltd.	(simple)	r
quart	qt	District of Columbia	D.C.	covariance	cov
yard	yd	et alii (and others)	et al.	degree (angular)	°
		et cetera (and so forth)	etc.	degrees of freedom	df
Time and temperature		exempli gratia		expected value	<i>E</i>
day	d	(for example)	e.g.	greater than	>
degrees Celsius	°C	Federal Information		greater than or equal to	≥
degrees Fahrenheit	°F	Code	FIC	harvest per unit effort	HPUE
degrees kelvin	K	id est (that is)	i.e.	less than	<
hour	h	latitude or longitude	lat. or long.	less than or equal to	≤
minute	min	monetary symbols		logarithm (natural)	ln
second	s	(U.S.)	\$, ¢	logarithm (base 10)	log
		months (tables and		logarithm (specify base)	log ₂ , etc.
Physics and chemistry		figures): first three		minute (angular)	'
all atomic symbols		letters	Jan,...,Dec	not significant	NS
alternating current	AC	registered trademark	®	null hypothesis	H ₀
ampere	A	trademark	™	percent	%
calorie	cal	United States		probability	P
direct current	DC	(adjective)	U.S.	probability of a type I error	
hertz	Hz	United States of		(rejection of the null	
horsepower	hp	America (noun)	USA	hypothesis when true)	α
hydrogen ion activity	pH	U.S.C.	United States	probability of a type II error	
(negative log of)			Code	(acceptance of the null	
parts per million	ppm	U.S. state	use two-letter	hypothesis when false)	β
parts per thousand	ppt, ‰		abbreviations	second (angular)	"
			(e.g., AK, WA)	standard deviation	SD
volts	V			standard error	SE
watts	W			variance	
				population	Var
				sample	var

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ABSTRACT

The Alaska Department of Fish and Game (ADF&G), Division of Commercial Fisheries, Arctic-Yukon-Kuskokwim (AYK) Region is creating a salmon database management system (DBMS). The goal of the database is to provide managers, researchers, and the public involved in salmon fisheries in the AYK Region with a system to enter and process new data, as well as to retrieve historical data. An important data set within the AYK salmon DBMS consists of biological measurements and sex and age determinations of salmon sampled throughout AYK Region since 1960. These age, sex, and length (ASL) data resided in many forms and in the process of coalescing into a database needed to be reformatted and standardized. The final step has been to assess the accuracy of these data through comparison with original publications of ASL data. This report represents an annual report for a project (URE-17N-05) funded to error check and finalize Yukon River ASL data as part of the Yukon River U.S. and Canada Salmon Treaty implementation program. All ASL data currently in the DBMS from the Yukon River were made available for review. Most of these data correctly matched with the report summaries, or differed by only a few fish. Corrections were made to address substantial differences.

Key words: Yukon River, salmon, *Oncorhynchus*, age-sex-length data, ASL data.

INTRODUCTION

Salmon *Oncorhynchus* sp. age, sex, and length (ASL) data are collected annually from escapement, run timing and abundance monitoring projects as well as sampled commercial and subsistence harvests throughout the Yukon River (Figure 1). Scales are collected primarily to determine the age of fish, but may also be examined for growth patterns. Since the distance between scale annuli represents the growth of a fish in 1 year, scales are a permanent record of annual growth over the lifetime of an individual salmon. Salmon length is generally represented by a measurement to the nearest 5 millimeters from mid-eye to tail fork. Sex of the salmon is determined from either external characteristics or internal inspection of reproductive organs.

Age, sex, and length data have been collected in the Yukon Area since 1960 (Table 1). All salmon species have been sampled, but the emphasis has been on chum and Chinook salmon. Scales collected from salmon are stored on gum cards along with an acetate impression used to determine age. Both records are organized into files by year, species, and project and stored in cabinets located in the Anchorage Alaska Department of Fish and Game (ADF&G) office. Paper copies of ASL data are filed in the same location. In most years, ASL data were converted to electronic data files located on either mainframe or personal computers. However, no formal archiving system was established and some of the electronic data have been lost.

Much of the ASL data collected from Yukon River Chinook and chum salmon predates current computer technology and since the advent of faster computers, development of data management techniques, and modification of ASL methodology (i.e., total length verses mid-eye to fork length measurements) no standardization of the ASL data set has occurred. In some cases, data sets for individual projects can represent a time span of 40 years and involve a significant volume of information.

The department has been funded to compile, standardize, and load the Yukon ASL database through the U.S. Fish and Wildlife Service Office of Subsistence Management Project FIS 04-701 (Brannian et al. 2004, 2005a, 2005b, 2006) and has completed a majority of the work. This work includes data being reviewed for record and field completeness, duplication of header information, key uniqueness and possible gross errors. However, data still needs to be checked for accuracy. In 2005 the USFWS Division of Fisheries and Habitat Conservation provided funding through Yukon River Treaty implementation funding to complete the remaining portions

of the data set, including error checking, so that the Yukon River ASL database can be more accessible to managers and other interested parties. This report summarizes the work being funded and represents the final report for project URE-17N-05.

Recently, several questions have arisen about the condition of Yukon River Chinook stocks that might be addressed by an examination of historic ASL information. Hyer and Schleusner (2005) found it difficult to obtain data and would have benefited from the results of this project. In contrast, upon completion of this project and progress made by FIS 04-701 members of the Yukon River Joint Technical Committee (D. Evenson, Commercial Fisheries Biologist, ADF&G, Anchorage; personal communication) found Chinook ASL data easy to search and retrieve in a format that was readily accessible.

PROJECT OBJECTIVES

Specific objectives or tasks were funded for completion by URE-17N-05 for the period from July 1, 2005 to June 30, 2006 and include:

1. Inspect the existing Yukon River ASL database for remaining incomplete sections (mostly identified) and complete as necessary.
2. Compare outputs from the current database with previously published reports and identify any differences that need to be researched.
3. Research the differences found in objective 2.
4. Make any corrections that are found to be necessary from objective 3.
5. Conduct final error check.

METHODS

ASL data from the master database (Brannian et al. 2006) were queried and printouts (Table 2 and Figure 2) were created that could be compared to historical reports and data summaries. For years prior to 1995 historical reports from the catch and escapement series 1982–1989, 1992 and 1994 (Wilcock and Schneiderhan 1991) and other similar annual summaries (McBride and Wilcock 1983) formed the historical basis for comparison. In the years 1993 and 1995–2003, data summaries that were compiled but never published were used (D. Schneiderhan, Commercial Fisheries Biologist, ADF&G, Anchorage, unpublished data; R. A. Price, Commercial Fisheries Biologist, ADF&G, Anchorage, unpublished data; Price *Unpublished*; DuBois *Unpublished*). The electronic data were grouped by year, species, location, project type, gear type and mesh size. The numbers of fish sampled, number aged and number of fish whose lengths were recorded were calculated for each grouping. A technician familiar with ASL data collection terminology and methods then systematically compared these numbers to reports or historical printouts when they were available. Where there were major discrepancies between the database data and report summary (typically > 10 fish) the matter was further investigated by looking at the original electronic file or data forms when available. The technician consulted with a database manager when they could not solve discrepancies. Minor discrepancies were noted in the technician's notebook but not further investigated.

Several additional data fields were also verified. ASL samples from commercial fisheries were checked for period code correctness. The outliers of length data and nonsense age data were also reviewed. If suspect data were found the electronic data were checked against the individual fish

in the raw data files. The technician also entered missing data into the database from paper data forms.

The corrections to the database were either made by the database manager or the project technician. A list of years for which reference reports could not be found was created for future work. The technician's working notebooks were also retained for notes on minor discrepancies.

RESULTS AND DISCUSSION

All ASL data currently in the database from the Yukon River were made available for review. Most of these data correctly matched with the report summaries, or differed by only a few fish. Common errors included accidental duplication of data (which were deleted) and errors in header data which caused improper lumping or separation of groupings (which were corrected). The technician entered about 70 files of ASL data into the database and scanned old format "bubble sheets". These data represent all remaining data we are aware of that were not previously in the database. Yukon ASL data in the AYK salmon database management system (DBMS) is now 100% complete, represents 93.3% of known data (Table 1) and 2,076 files (or project-year-species datasets).

Difficulty arose as historical summaries were not available for comparison against all data collections. For Chinook salmon much of these data were collected in the Canadian portion of the drainage or are represented or specialized sampling events not associated with long term tributary monitoring projects (Table 3). Also, some data sets were omitted from reports or geographically grouped differently each year. This was especially common in reports from the 1960's and 70's. Noting these exceptions, the remaining ASL data were checked, corrected where needed, and now match previously reported summaries. En masse comparison checks of ASL data by technicians should now be considered complete, and further correction of problem data sets should be left to biologists with a working knowledge of historical sampling strategies. Further corrections will be made through the data interface application. A complete list of data that could not be checked against reports will be published for future reference.

PROBLEMS

The database manager noted several problems that will be corrected in the course of completing the OSM project component of database development. They are:

1. Combine redundant headers. Redundant headers will be fixed globally as part of the DBMS project.
2. Update, edit, and standardize mesh size designations for ASL samples from gillnet captured salmon.
3. Make available to DBMS users a complete list of data that could not be checked against reports or unpublished summary tables.

RECOMMENDATIONS

We recommend the following:

1. Additional projects are funded to conduct the same error checking of Yukon River escapement survey data (aerial, foot and boat surveys).
2. Additional projects are funded to review, error check, and add new Yukon River data sets to the AYK salmon database management system. Examples of additional data sets are; test fish data, brood table data, and environmental data.
3. Additional projects are funded to standardize and edit mesh size designations for ASL samples from gillnet captured salmon.
4. All problems noted by this project are addressed prior to release of the DBMS.

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TABLES AND FIGURES

Table 1.—Estimated number and status of age, sex, and length data files by area and salmon species for the AYK Region, June 30, 2006.

AYK Age-Sex-Length Data Inventory Summary							
Area	Species	Approximate Total Number of Files	In Database	To be Added	Missing Files	% Found ASL Data Loaded Into Database	% Total Estimated ASL Data Recovered
Kotzebue	Chinook	5	4	0	1	100.0%	80.0%
	Sockeye	6	5	0	1	100.0%	83.3%
	Coho	3	2	0	1	100.0%	66.7%
	Pink	2	1	0	1	100.0%	50.0%
	Chum	184	158	8	23	98.1%	87.5%
	<i>Total Files</i>	<i>200</i>	<i>170</i>	<i>8</i>	<i>27</i>	<i>98.3%</i>	<i>86.5%</i>
Port Clarence	Chinook	4	3	0	1	100.0%	75.0%
	Sockeye	10	8	1	1	88.9%	90.0%
	Coho	3	3	0	0	100.0%	100.0%
	Pink	-	-	-	-	-	-
	Chum	5	5	0	0	100.0%	100.0%
	<i>Total Files</i>	<i>22</i>	<i>19</i>	<i>1</i>	<i>2</i>	<i>95.0%</i>	<i>90.9%</i>
Norton Sound	Chinook	123	110	8	7	94.8%	94.3%
	Sockeye	10	8	1	1	88.9%	90.0%
	Coho	102	97	1	4	99.0%	96.1%
	Pink	15	1	12	2	7.7%	86.7%
	Chum	226	177	29	20	85.9%	91.2%
	<i>Total Files</i>	<i>476</i>	<i>393</i>	<i>51</i>	<i>34</i>	<i>88.9%</i>	<i>92.9%</i>
Yukon	Chinook	1,070	1,014	0	62	100.0%	94.8%
	Sockeye	18	17	0	1	100.0%	94.4%
	Coho	190	175	0	15	100.0%	92.1%
	Pink	2	2	0	0	100.0%	100.0%
	Chum	946	868	0	78	100.0%	91.8%
	<i>Total Files</i>	<i>2,226</i>	<i>2,076</i>	<i>0</i>	<i>156</i>	<i>100.0%</i>	<i>93.3%</i>
Kuskokwim	Chinook	344	318	11	16	97.0%	95.3%
	Sockeye	231	215	3	13	98.6%	94.4%
	Coho	207	198	1	9	100.0%	95.7%
	Pink	12	11	0	1	100.0%	91.7%
	Chum	318	291	10	18	97.0%	94.3%
	<i>Total Files</i>	<i>1,112</i>	<i>1,033</i>	<i>25</i>	<i>57</i>	<i>97.9%</i>	<i>94.9%</i>
Total ASL Files		4,036	3,691	85	276	96.1%	93.2%

Table 2.—Example of a table listing ASL sample numbers from the AYK salmon DBMS.

district	subDistrict	project	location	species	gear	mesh	year	NumSampled	numFem	numSexed	2	3	4	5	6	7	8
Yukon Area	Y1 (Subdistrict 1)	Subsistence Catch	Alakanuk	Chinook	Set Gillnet	-1	1960	30	9	30	0	0	0	0	0	0	0
Yukon Area	Y1 (Subdistrict 1)	Subsistence Catch	Middle Mouth	Chinook	Set Gillnet	-1	1960	27	15	27	0	0	0	0	0	0	0
Yukon Area	Y1 (Subdistrict 1)	Commercial Catch	Lower Yukon River	Chinook	Fishwheel	-1	1961	28	0	0	0	0	0	0	0	0	0
Yukon Area	Y2 (Subdistrict 2)	Commercial Catch	St. Marys	Chinook	Unknown	-1	1961	38	0	0	0	0	0	0	0	0	0
Yukon Area	Y1 (Subdistrict 1)	Commercial Catch	Flat Island	Chinook	Set Gillnet	8.5	1964	700	309	700	0	0	35	74	282	93	4
Yukon Area	Y6 (Subdistrict 6)	Commercial Catch	Woodchopper	Chinook	Fishwheel	-1	1964	73	5	73	0	3	9	31	14	5	0
Yukon Area	Y1 (Subdistrict 1)	Commercial Catch	Flat Island	Chinook	Set Gillnet	8.5	1965	676	282	676	0	1	5	89	280	110	2
Yukon Area	Y1 (Subdistrict 1)	Test Fishing	Flat Island	Chinook	Set Gillnet	7	1965	101	46	101	0	0	0	21	38	11	1
Yukon Area	Y1 (Subdistrict 1)	Test Fishing	Flat Island	Chinook	Set Gillnet	8.5	1965	88	49	88	0	0	1	16	36	19	1
Yukon Area	Y1 (Subdistrict 1)	Test Fishing	Flat Island	Chinook	Set Gillnet	10	1965	12	2	12	0	0	0	3	8	1	0
Yukon Area	Y1 (Subdistrict 1)	Commercial Catch	Alakanuk	Chinook	Set Gillnet	8.5	1966	1018	467	1017	0	0	7	123	610	120	0
Yukon Area	Y1 (Subdistrict 1)	Commercial Catch	Flat Island	Chinook	Set Gillnet	8.5	1966	12	9	12	0	0	0	0	4	0	0
Yukon Area	Y1 (Subdistrict 1)	Test Fishing	Flat Island	Chinook	Set Gillnet	5.5	1966	11	3	11	0	0	3	1	4	1	0
Yukon Area	Y1 (Subdistrict 1)	Test Fishing	Flat Island	Chinook	Set Gillnet	7	1966	35	16	35	0	0	1	11	16	2	0
Yukon Area	Y1 (Subdistrict 1)	Test Fishing	Flat Island	Chinook	Set Gillnet	8.5	1966	158	68	156	0	0	1	8	93	10	0
Yukon Area	Y1 (Subdistrict 1)	Test Fishing	Flat Island	Chinook	Set Gillnet	9.5	1966	3	1	3	0	0	0	1	2	0	0
Yukon Area	Y1 (Subdistrict 1)	Test Fishing	Middle Mouth	Chinook	Set Gillnet	5.5	1966	2	2	2	0	0	0	0	2	0	0
Yukon Area	Y1 (Subdistrict 1)	Test Fishing	Middle Mouth	Chinook	Set Gillnet	8.5	1966	3	0	3	0	0	0	0	3	0	0
Yukon Area	Y4 (Subdistrict 4)	Commercial Catch	Rampart	Chinook	Fishwheel	-1	1966	12	0	6	0	0	9	2	0	0	0
Yukon Area	Y4 (Subdistrict 4)	Commercial Catch	Rampart	Chinook	Set Gillnet	-1	1966	5	1	5	0	0	1	0	4	0	0
Yukon Area	Y6 (Subdistrict 6)	General Escapement	Salcha River	Chinook	Handpicked or carcass	-1	1966	26	8	25	0	0	3	7	13	2	0
Yukon Area	Y1 (Subdistrict 1)	Test Fishing	Alakanuk	Chinook	Set Gillnet	5.5	1967	1	1	1	0	0	0	0	0	0	0
Yukon Area	Y4 (Subdistrict 4)	General Escapement	Andreafsky River, West Fork	Chinook	Handpicked or carcass	-1	1967	28	8	27	0	0	7	9	11	1	0
Yukon Area	Y4 (Subdistrict 4)	General Escapement	Anvik River	Chinook	Handpicked or carcass	-1	1967	14	5	14	0	0	0	1	12	1	0
Yukon Area	Y1 (Subdistrict 1)	Commercial Catch	Flat Island	Chinook	Set Gillnet	8.5	1967	891	444	891	0	0	21	88	632	130	3
Yukon Area	Y1 (Subdistrict 1)	Test Fishing	Flat Island	Chinook	Set Gillnet	5.5	1967	19	10	19	0	0	1	3	10	1	0
Yukon Area	Y1 (Subdistrict 1)	Test Fishing	Flat Island	Chinook	Set Gillnet	8.5	1967	132	70	132	0	1	2	11	92	20	0
Yukon Area	Y1 (Subdistrict 1)	Test Fishing	Middle Mouth	Chinook	Set Gillnet	8.5	1967	7	6	7	0	0	0	0	5	2	0
Yukon Area	Y5 (Subdistrict 5)	Commercial Catch	Rampart	Chinook	Fishwheel	-1	1967	34	11	32	0	0	4	13	13	2	0
Yukon Area	Y5 (Subdistrict 5)	General Escapement	Teslin, B.C., Canada	Chinook	Unknown	-1	1967	83	71	83	0	0	0	4	52	22	0
Yukon Area	Y1 (Subdistrict 1)	Commercial Catch	Alakanuk	Chinook	Set Gillnet	8.5	1968	1016	545	1016	0	0	12	98	682	200	0
Yukon Area	Y2 (Subdistrict 2)	General Escapement	Andreafsky River, West Fork	Chinook	Handpicked or carcass	-1	1968	15	3	15	0	1	0	9	3	2	0
Yukon Area	Y4 (Subdistrict 4)	General Escapement	Anvik River	Chinook	Handpicked or carcass	-1	1968	20	0	20	0	4	4	10	1	1	0
Yukon Area	Y3 (Subdistrict 3)	Test Fishing	Dogfish Village	Chinook	Set Gillnet	7	1968	16	5	16	0	0	1	7	7	1	0
Yukon Area	Y3 (Subdistrict 3)	Test Fishing	Dogfish Village	Chinook	Set Gillnet	8.5	1968	33	11	33	0	0	1	6	15	10	0
Yukon Area	Y1 (Subdistrict 1)	Commercial Catch	Emmonak	Chinook	Set Gillnet	8.5	1968	345	203	345	0	0	22	71	182	70	0
Yukon Area	Y4 (Subdistrict 4)	General Escapement	Fishing Branch River	Chinook	Set Gillnet	-1	1968	21	0	21	0	0	4	10	4	0	0
Yukon Area	Y1 (Subdistrict 1)	Commercial Catch	Flat Island	Chinook	Set Gillnet	5.5	1968	174	83	170	0	0	8	15	114	24	0
Yukon Area	Y2 (Subdistrict 2)	Test Fishing	Ohogamiut	Chinook	Set Gillnet	8.5	1968	278	119	277	0	1	44	49	99	23	0
Yukon Area	Y3 (Subdistrict 3)	Test Fishing	Paimiut	Chinook	Set Gillnet	8.5	1968	92	26	92	0	0	17	22	35	18	0
Yukon Area	Y6 (Subdistrict 6)	General Escapement	Salcha River	Chinook	Set Gillnet	-1	1968	19	3	16	0	0	3	5	7	3	0
Yukon Area	Y5 (Subdistrict 5)	General Escapement	Teslin, B.C., Canada	Chinook	Unknown	-1	1968	34	26	34	0	0	1	4	23	5	0
Yukon Area	Y5 (Subdistrict 5)	General Escapement	Whitehorse, Y.T., Canada	Chinook	Handpicked or carcass	-1	1968	9	0	5	0	0	1	3	2	3	0

Table 3.—List of Chinook salmon data sets in which database information could not be verified by reports or historical summaries (1984–1997).

Year	Location	Gear Type/ Method	Year	Location	Gear Type/ Method
1997	Chena River	Electrofishing	1992	Andreafsky River, East Fork	Handpicked/ Carcass
1997	Sheep Rock	Fish wheel	1992	Big Eddy	Drift Gillnet
1997	White Rock	Fish wheel	1992	Big Eddy	Set Gillnet
1996	Nulato River	Beach Seine	1992	Middle Mouth	Drift Gillnet
1996	Chena River	Electrofishing	1992	Middle Mouth	Set Gillnet
1996	Salcha River	Electrofishing	1992	Nenana	Fish wheel
1996	Sheep Rock	Fish wheel	1990	Henshaw Creek	Weir
1996	White Rock	Fish wheel	1989	Gisasa River	Set Gillnet
1995	Grayling	Fish wheel	1989	Chulitna River	Set Gillnet
1995	Galena	Set Gillnet	1989	Tozitna River	Set Gillnet
1995	Nenana	Fish wheel	1989	Andreafsky River, West Fork	Handpicked/ Carcass
1995	Rampart Rapids	Set Gillnet	1989	Anvik River	Unknown
1995	Ruby	Fish wheel	1989	Anvik River	Handpicked/ Carcass
1995	Chena River	Handpicked/ Carcass	1989	Chena River	Handpicked/ Carcass
1995	Chena River	Electrofishing	1989	Salcha River	Handpicked/ Carcass
1995	Salcha River	Handpicked/ Carcass	1989	Andreafsky River, East Fork	Handpicked/ Carcass
1995	Chatakника, Bluff Cabin Slough	Handpicked/ Carcass	1989	Big Salmon River	Handpicked/ Carcass
1995	Big Eddy	Set Gillnet	1989	Little Salmon River	Handpicked/ Carcass
1994	Nulato River	Beach Seine	1989	Nisutlin River	Handpicked/ Carcass
1994	Andreafsky River, East Fork	Weir	1989	Swift River	Handpicked/ Carcass
1994	Anvik River	Handpicked/ Carcass	1989	Tatchun Creek	Handpicked/ Carcass
1994	Chena River	Handpicked/ Carcass	1989	Ross River	Handpicked/ Carcass
1994	Salcha River	Handpicked/ Carcass	1989	Nordenskiold River	Handpicked/ Carcass
1993	Middle Mouth	Set Gillnet	1989	Wolf River	Handpicked/ Carcass
1993	Sheep Rock	Fish wheel	1989	Morley River	Handpicked/ Carcass
1993	White Rock	Fish wheel	1989	Bear Feed Creek	Handpicked/ Carcass
1992	Sheep Rock	Fish wheel	1989	Ingersoll Islands, Y.T., Canada	Handpicked/ Carcass
1992	White Rock	Fish wheel	1989	Sheep Rock	Fish wheel
1992	Andreafsky River, East Fork	Handpicked/ Carcass	1989	White Rock	Fish wheel
1992	Anvik River	Handpicked/ Carcass	1989	Moose Rock	Fish wheel
1992	Chena River	Handpicked/ Carcass	1988	Anvik River	Beach Seine
1992	Chena River	Electrofishing	1988	Andreafsky River, East Fork	Beach Seine
1992	Salcha River	Handpicked/ Carcass	1988	Andreafsky River, East Fork	Hook and Line
1992	Salcha River	Electrofishing	1988	Andreafsky River, West Fork	Unknown
1992	Goodpaster River	Handpicked/ Carcass	1988	Andreafsky River, West Fork	Hook and Line

-continued-

Table 3.–Page 2 of 2.

Year	Location	Gear Type/ Method	Year	Location	Gear Type/ Method
1988	Andreafsky River, West Fork	Handpicked/ Carcass	1987	Andreafsky River, West Fork	Handpicked/ Carcass
1988	Anvik River	Handpicked/ Carcass	1987	Anvik River	Handpicked/ Carcass
1988	Nulato River	Handpicked/ Carcass	1987	Nulato River	Handpicked/ Carcass
1988	Nulato River	Handpicked/ Carcass	1986	Anvik River	Beach Seine
1988	Nulato River	Handpicked/ Carcass	1986	Anvik River	Handpicked/ Carcass
1988	Chena River	Handpicked/ Carcass	1986	Clear Creek Hatchery	Weir
1988	Salcha River	Handpicked/ Carcass	1986	Nulato River	Handpicked/ Carcass
1988	Salcha River	Handpicked/ Carcass	1986	Chena River	Handpicked/ Carcass
1988	Salcha River	Handpicked/ Carcass	1986	Salcha River	Handpicked/ Carcass
1988	Andreafsky River, East Fork	Sport Hook and Line	1986	Teslin, B.C., Canada	Handpicked/ Carcass
1988	Andreafsky River, East Fork	Handpicked/ Carcass	1986	Big Salmon River	Handpicked/ Carcass
1988	Big Salmon River	Handpicked/ Carcass	1986	Jim River	Handpicked/ Carcass
1988	Gisasa River	Handpicked/ Carcass	1986	Koyukuk River	Handpicked/ Carcass
1988	Koyukuk River	Handpicked/ Carcass	1986	Nisutlin River	Handpicked/ Carcass
1988	Little Salmon River	Handpicked/ Carcass	1986	Tatchun Creek	Handpicked/ Carcass
1988	Nisutlin River	Handpicked/ Carcass	1986	Yukon Crossing, Y.T., Canada	Handpicked/ Carcass
1988	Tatchun Creek	Handpicked/ Carcass	1985	Aniak River	Beach Seine
1988	Ross River	Unknown	1985	Aniak River	Set Gillnet
1988	Ross River	Handpicked/ Carcass	1985	Big Eddy	Set Gillnet
1988	Yukon Crossing, Y.T., Canada	Handpicked/ Carcass	1984	Anvik River	Set Gillnet
1988	Takhini River	Handpicked/ Carcass	1984	Whitehorse, Y.T., Canada	Unknown
1988	Ingersoll Islands, Y.T., Canada	Handpicked/ Carcass	1984	Andreafsky River, East Fork	Beach Seine
1988	Middle Mouth	Set Gillnet	1984	Andreafsky River, East Fork	Sport Hook and Line
1987	Teslin, B.C., Canada	Unknown	1984	Andreafsky River, West Fork	Handpicked/ Carcass
1987	Chandalar River	Set Gillnet	1984	Anvik River	Handpicked/ Carcass
1987	Rampart	Set Gillnet	1984	Chena River	Handpicked/ Carcass
1987	Rampart	Fish wheel	1984	Salcha River	Handpicked/ Carcass
1987	Rampart Rapids	Set Gillnet	1984	Andreafsky River, East Fork	Handpicked/ Carcass
1987	Rampart Rapids	Fish wheel	1984	Big Salmon River	Handpicked/ Carcass
1987	Haul Road Bridge	Set Gillnet	1984	Little Salmon River	Handpicked/ Carcass
1987	Haul Road Bridge	Fish wheel	1984	Nisutlin River	Unknown
1987	Galena	Set Gillnet	1984	Nisutlin River	Handpicked/ Carcass
1987	Galena	Fish wheel	1984	Tatchun Creek	Handpicked/ Carcass
1987	Haul Road Bridge	Set Gillnet	1984	Big Eddy	Set Gillnet
1987	Andreafsky River, East Fork	Beach Seine	1984	Middle Mouth	Set Gillnet
1987	Clear Creek Hatchery	Weir	1984	Stink Creek	Fish wheel

Note: From 1998 to 2005 all significant Chinook data sets could be verified through reports or historical summaries.



Figure 1.—Arctic-Yukon-Kuskokwim salmon management areas for the Division of Commercial Fisheries, ADF&G.

year ASL Data Summaries -
Species: Chinook

Project: Commercial Catch
Location: Anvik Bluff
Gear: Fishwheel

Mesh Size: -1

	Number Sampled	Number Females	Prop Female	Age 3		Age 4		Age 5		Age 6		Age 7		Age 8		Number Sexed	Number Aged
				No.	prop	No.	prop	No.	prop	No.	prop	No.	prop	No.	prop		
1995	3	2	0.67	0	0.00	0	0.00	0	0.00	2	1.00	0	0.00	0	0.00	3	2
Mesh Total:	3	2	0.67	0	0.00	0	0.00	0	0.00	2	1.00	0	0.00	0	0.00	3	2

Gear: Set Gillnet

Mesh Size: -1

	Number Sampled	Number Females	Prop Female	Age 3		Age 4		Age 5		Age 6		Age 7		Age 8		Number Sexed	Number Aged
				No.	prop	No.	prop	No.	prop	No.	prop	No.	prop	No.	prop		
1994	2	1	0.50	0	0.00	1	0.50	1	0.50	0	0.00	0	0.00	0	0.00	2	2
Mesh Total:	2	1	0.50	0	0.00	1	0.50	1	0.50	0	0.00	0	0.00	0	0.00	2	2

Mesh Size: 5

	Number Sampled	Number Females	Prop Female	Age 3		Age 4		Age 5		Age 6		Age 7		Age 8		Number Sexed	Number Aged
				No.	prop	No.	prop	No.	prop	No.	prop	No.	prop	No.	prop		
1992	9	2	0.22	0	0.00	3	0.60	2	0.40	0	0.00	0	0.00	0	0.00	9	5
1995	7	2	0.29	0	0.00	3	0.43	2	0.29	2	0.29	0	0.00	0	0.00	7	7
Mesh Total:	16	4	0.25	0	0.00	6	0.50	4	0.33	2	0.17	0	0.00	0	0.00	16	12

Mesh Size: 5.5

	Number Sampled	Number Females	Prop Female	Age 3		Age 4		Age 5		Age 6		Age 7		Age 8		Number Sexed	Number Aged
				No.	prop	No.	prop	No.	prop	No.	prop	No.	prop	No.	prop		
1992	11	1	0.09	0	0.00	3	0.33	4	0.44	1	0.11	1	0.11	0	0.00	11	9

Tuesday, November 07, 2006

Figure 2.–Yukon River ASL database summary used to compare against historic ASL reports (published and unpublished).